

# SECTION 3000

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## SECTION 3000

**IN-HOUSE RESEARCH****3100 Research Performed Within Caltrans**

*Research projects are conducted primarily in two different ways, either in-house or under contract by outside entities. In order to avoid confusion and to show how in-house and outside research are managed differently, each one will be discussed in a separate chapter.*

***Benefits and Uses of In-house Research***

- Bring scientific and technical knowledge to bear on transportation problems.
- Give transportation administrators and managers reliable and substantive advice (quick and accurate) during emergencies and natural disaster situations.
- Serve as a knowledgeable and unbiased resource for determining criteria and recommending priorities for transportation program investment, project development and policy implementation.
- Rapidly assess emerging research results and determine appropriate applications to benefit the State's transportation program.
- Evaluate field-implemented transportation innovations for cost-saving and safety implications before authorizing standardized use.
- Provide a professional knowledge base for soliciting, awarding, monitoring and evaluating an appropriate level of high-quality and cost-effective contracted research.

*Most research projects are, by law (refer to Government Code 19130-b), required to be conducted in-house by Department personnel, usually from the Office of Pavement & Research Management (OPRM). However, if particular conditions warrant and qualified personnel are available, District personnel or another Headquarters unit may be assigned to conduct the research project. Research projects involving more than one unit require the necessary interaction and cooperation from all parties in order to achieve project objectives.*

*Below are several key points and guidelines to remember and follow during the research process. For a more complete discussion on conducting research, see Appendix E.*

## 3200 Tips for Successful Project Administration

- The program is developed on a continuous basis. Each new addition to the program requires a completed research project request form which outlines the problems, objectives, scope, and justification of the proposed project. Complete this form with the reader in mind. This is the primary "sales tool" for a project. Since some of the people involved in the development of the research program do not have an understanding of the technical details, the form should be completed in clear nontechnical language. Do not rely on technical jargon to justify the project. Pay particular attention to developing a concise, descriptive title for the project.
- Proposals for new projects and submittals to modify continuing projects may be submitted at any time for approval.
- Be aware of the tendency to "bite off more than one can chew" (in terms of defining the scope of the research) in the work plan.
- Do not omit the necessary literature search prior to a research effort (see Appendix C). In addition to the literature search, contact experts on the subject and discuss your research intentions with them.
- Staff the project with personnel that understand both the academic and practical viewpoints.
- Be sure to establish statistical controls.
- Do not neglect a continuous planning review. Planning is important to maintain project organization, to meet time schedules with completed interim or final reports and basically for overall project control.
- Design the research methodology in detail and revise when necessary.
- When conducting the research project, follow the definite, detailed plan outlined in the research proposal.
- Avoid deviating from the plan or enlarging the project scope unless it has been determined that the project objectives will not be met through the original design.
- Seek approval from appropriate authority if variations from the approved work plan are needed.
- Maintain project boundaries. Do not permit the project to grow as it progresses.
- Maintain objectivity. Do not allow preconceived notions to influence the analysis and conclusions.

- Prepare reports that focus on the new-found knowledge not on numerous pages of statistical and technical details.
- If unsure of a procedure concerning project administration, check first with the OPRM. This could save you from doing a task twice.
- Quarterly progress reports and cash flow plans are required from Caltrans contract managers and Caltrans principal investigators for all research projects. These reports should be submitted for the quarters ending in March, June, September and December. These reports are due six weeks after the end of quarter being reported on.
- Principal investigators and contract managers should have a TRAMS account set-up or an accounting representative run expenditure reports at least quarterly.
- Write your report as you go along. Some researchers write comprehensive quarterly reports which are very helpful when it is time to write the final report.
- Prepare charts, graphs, tables, photographs etc., in their final format as soon as possible.
- In order to plan for a smooth transition of project findings to implementable benefits, other parties who are responsible for implementation should be brought on board early.
- Involve other people (technicians, etc.) in the work plan preparation. Also, where appropriate, involve people from design, construction, district, etc.
- Hold regular meetings with the people involved in the research project to make sure it is staying on track.
- Always examine your data closely for internal consistency before beginning your analysis.
- Don't push your data further than it was meant to go. An attempt to quantify the effects of many variables with a meager database will only lead to more questions than you started with.

## 3300 Research Project Staff

Personnel assigned to the roles of principal investigator and co-principal investigator should be thoroughly knowledgeable of the Department's operations related to the project, the subject area, and applicable research techniques to professionally conduct a valid research study. If the assigned personnel are not informed about these areas, personnel with this knowledge should be assigned to the project in a consulting capacity, or be on the project technical support panels.

A principal investigator (or co-principal investigator) should devote the major portion of their time to conducting the research project (if the nature of the project permits continuous work). Failure to do so could result in project delays, increases in project costs, or lead to project findings of minimal quality.

For a more detailed description of staff responsibilities, see Section 1410, Administrative and Research Responsibilities.

## **3400 Purchase or Rental of Research Project Equipment with SP&R Funds**

SP&R research project funds should not be used to purchase or rent normal equipment in an adequately organized and equipped research and development laboratory. Normal equipment is defined as standard laboratory and office equipment such as testing machines and tables. SP&R research project funds are authorized, however, for the rental or purchase of specialized, nonexpendable equipment. This type of equipment is defined as equipment not usually provided by the Department and does not include normal equipment as defined above. In addition, the FHWA defines nonexpendable equipment as equipment costing more than \$500 per unit with a service life of one year or more.

All nonexpendable equipment purchased with SP&R research project funds must be accounted for throughout the life of the project. This is accomplished through an identification system (CT number), maintenance of property records, an inventory system, and disposition of the equipment at the conclusion of the project.

Equipment costs must be managed carefully so that only those equipment costs attributable to an SP&R research project will be charged to that project.

### **3410 Nonexpendable Equipment Statement**

Prior to or concurrent with the draft final report submittal of an SP&R participating research project, a statement regarding nonexpendable equipment purchased for the project should be submitted to the Office of Research.

The statement should provide detail on each item, a description (including make, model and serial number), condition, date of purchase and purchase price.

The statement should also reconcile the equipment shown in the research proposal or authorized later with the equipment that is being salvaged. Unless the equipment is to be disposed of at public auction, the statement should include the residual value for each item and justification for the residual value (such as method of depreciation and vendor's quote).

## 3420 Residual Values

Residual values of equipment must be approved by the Office of Pavement and Research Management (OPRM). This includes equipment covered in Section 3400 above for all nonexpendable equipment with a useful life of more than one year and a unit purchase price of \$500 or more. Additionally, residual values of items) such as cameras or binoculars) costing less than \$500 must also be approved.

The OPRM must approve residual values for:

- all equipment with a useful life of more than one year and a unit purchase price of \$500 or more.
- nonexpendable equipment for use on non-SP&R participating projects. The statement regarding nonexpendable equipment should indicate the desire. Once residual values are approved credit the research project with the amount of the approved residual value.
- nonexpendable equipment for use on other SP&R participating research. This desire should be stated in the nonexpendable equipment statement as well as the details of the proposed transfer. Upon approval of residual values, charge the amount of the approved residual value to the new or ongoing SP&R participating research project and credit the same amount to the project that the equipment was originally purchased under.

## 3430 Multiple-Project-Use Equipment

If Caltrans purchases or constructs specialized equipment to be used on more than one research project, the equipment may be purchased with other than research project funds. Then the same rental rate should be charged to each research project or other activity for which the specialized equipment is being used.

## 3440 Inventory Procedures

Each Principal Investigator is responsible for maintaining proper inventory records in accordance with Caltrans procedures for each piece of major equipment either purchased or built with study funds.

Major equipment, as defined by Section 4100 of the *Office of Business Management Manual*, Business Services, Volume 1, includes those items of equipment that have an approximate unit cost of \$500 or more and a normal life of two or more years.

Items under \$500 (such as cameras or binoculars) that are small and can be used for reasons other than as research equipment should also be inventoried.

### 3450 Disposal of Equipment

If a public auction is proposed for the disposal of surplus equipment, the nonexpendable equipment statement should include the following:

- who will conduct the auction,
- when and where will the auction be held,
- how will it be publicized, and
- two draft copies of the portion of the auction announcement that includes descriptions of the items up for bid.

The OPRM shall evaluate any proposed auction to dispose of equipment, and the OPRM has the authority to approve or disapprove of the disposal of equipment.

After the auction, the responsible research manager should report to the OPRM the results of the auction. The research project is credited with the amount of the net proceeds from the auction sale (after deducting the *pro rata* overhead charges for conducting the auction).

## 3500 Changes in the Research Project

If the need for major changes becomes apparent while the project is in progress, it may become necessary to revise one or more of the following: the work plan, time schedule, authorized costs, staff, or equipment.

All revisions must be submitted for approval, if possible, before continuing the work. Only the essential component parts of the originally approved item need be discussed in the revision, but the revision must be fully documented as to the need and the proposed revision delineated.

The approval process for these revisions is the same as for the research proposal. The revision(s) should be forwarded with justification to the Chief, OPRM.

Minor changes in funding (fiscal year or total cost) should be forwarded with justification by the project manager directly to the Chief, OPRM.

Changes in principal investigator or co-principal investigator require formal notification of the OPRM (see Section 1410, Administrative and Research Responsibilities).

## 3600 Termination of the Research Project

If research has started on an approved project, then later found to be unproductive, further research is unwarranted and the research project should be terminated immediately.

To terminate a research project under these circumstances, submit a formal termination request with six copies of a termination report to the Chief, OPRM. See Section 5720, How to Prepare the Termination Report, for the termination report outline.